



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

D204-635-041GB
Job Sheet 186042



Part No: D204-635-041GB

Job Qty: 1 pcs

Part Name: Replacement Skidtube with Standard Wearplates Fits LH or RH (Gloss Black)



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 11/8/18

Job Tracking No:

Due Date: 12/14/18

Created By: Jesse White

Type: SOLD

Description:

Note: DWG REV F SHEETS 1,2,3,6 IPP REV:A 17.08.31 NEW ISSUE DD VERF:DP

Ship Via:



SEE
Attached 11/12/18

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
110	Skidtubes - 1	1 pcs	12/14/18		0.00	2.25	Skidtubes - 1		
							Skidtubes - 2		
							Skidtubes - 3		MLG
							Skidtubes - 4		
							Skidtubes - 5		
							Skidtubes - 6		
							Skidtubes - 7		
111	QC 5	1 pcs	12/14/18		0.00	0.00	QC 5 - 10		
							QC 5 - 12		
							QC 5 - 16		
							QC 5 - 17		
							QC 5 - 18		BE
							QC 5 - 19		
							QC 5 - 22		
							QC 5 - 24		
							QC 5 - 3		
							QC 5 - 38		
							QC 5 - 42		
							QC 5 - 43		
							QC 5 - 49		
							QC 5 - 51		
							QC 5 - 58		
							QC 5 - 68		
							QC 5 - 9		
							QC 5 - 50		
							QC 5 - 30		
112	Handfinish - 1-1 Chemical-B4B	1 pcs	12/14/18		0.00	0.00	Handfinish - 1 - 1 - B4B		
							Handfinish - 1 - 2 - B4B		
							Handfinish - 1 - 3 - B4B		
							Handfinish - 1 - 4 - B4B		
							Handfinish - 1 - 5 -		

5127000

DART
AEROSPACE

1270 Aberdeen Street
Hawkesbury, ON K64 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Container No: S127000



Part: D204-635-041GB

Job No: 186042

Serial No/Batch: S127000

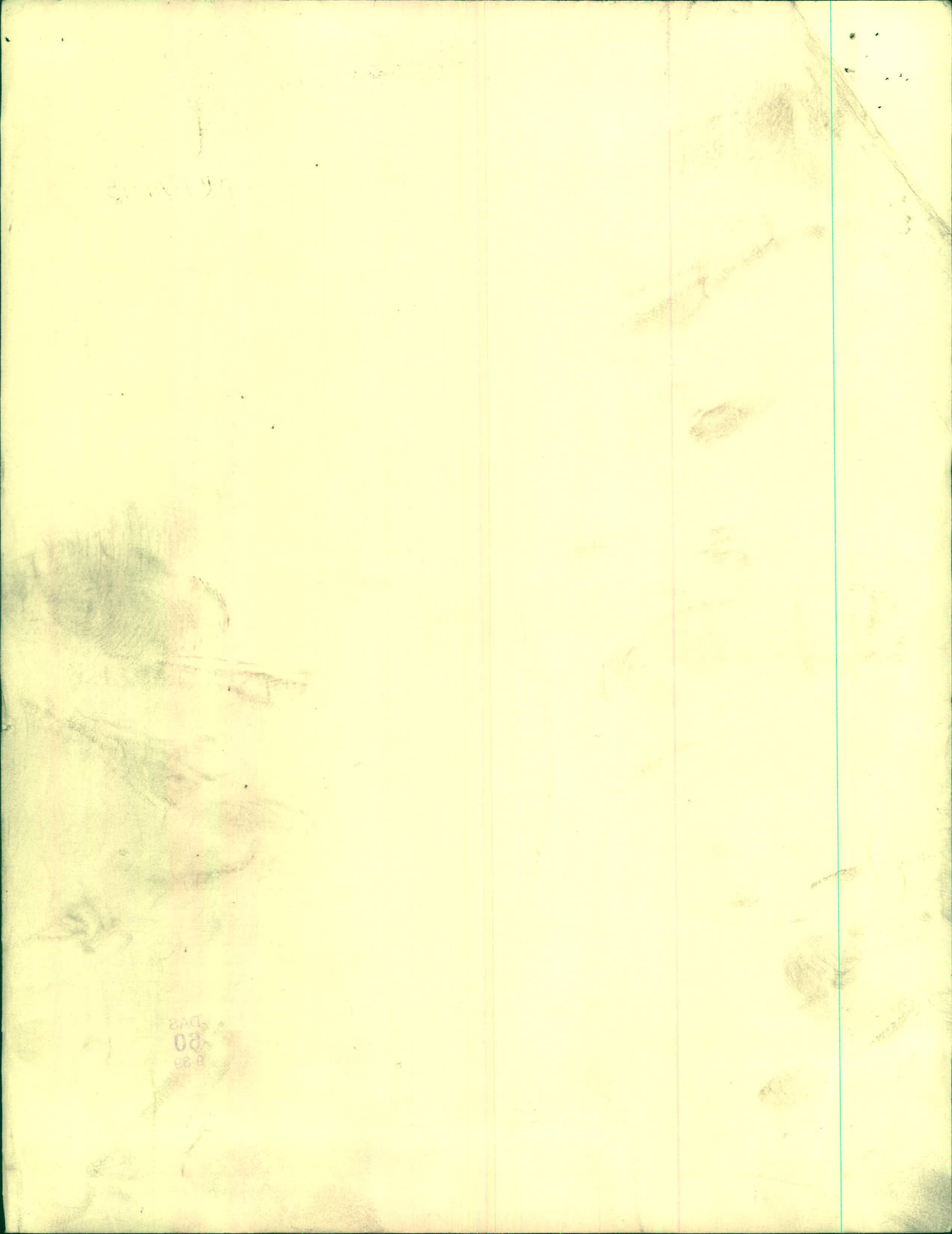
Revision: F

Inspector:

Exp Date:

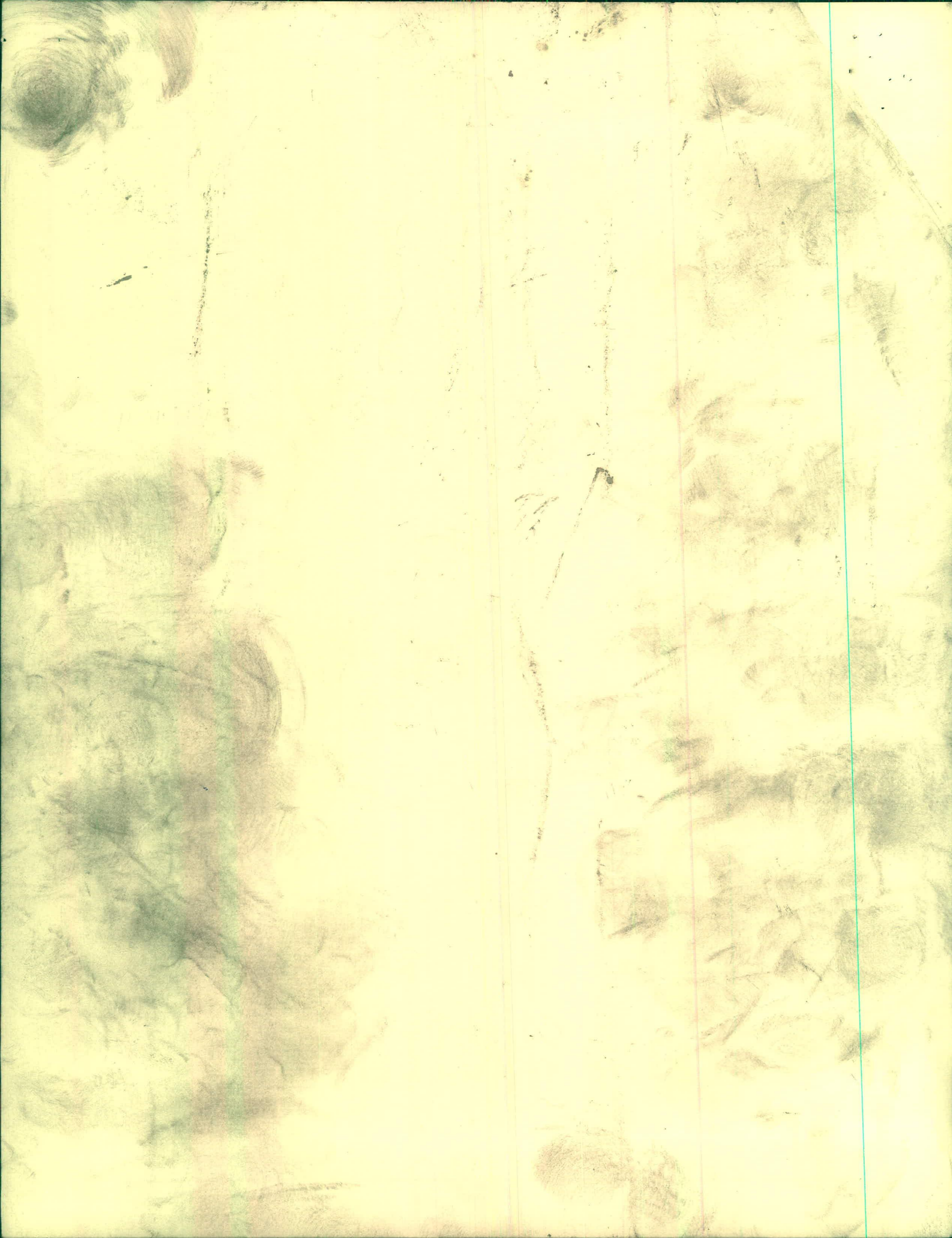
Instructions: TC STC SH96-88 Issue 3, FAA STC SR00563NY 08/08/11, EASA S

					B4B	
					Handfinish - 1 - 6 - B4B	
					Handfinish - 1 - 7 - B4B	
					Handfinish - 1 - 8 - B4B	
					Handfinish - 1 - 9 - B4B	
					Handfinish - 1 - 10 - B4B	D.R 18/11/15
					Handfinish - 1 - 11 - B4B	
					Handfinish - 1 - 12 - B4B	
					Handfinish - 1 - 13 - B4B	
					Handfinish - 1 - 14 - B4B	
					Handfinish - 1 - 15 - B4B	
					Handfinish - 1 - 16 - B4B	
					Handfinish - 1 - 17 - B4B	
					Handfinish - 1 - 18 - B4B	
					Handfinish - 1 - 19 - B4B	
					Handfinish - 1 - 20 - B4B	
					Handfinish - 1 - 21 - B4B	
					Handfinish - 1 - 22 - B4B	
113 QC 7	1 pcs	12/14/18	0.00	0.00	QC 7 - 10	
					QC 7 - 13	
					QC 7 - 14	
					QC 7 - 15	
					QC 7 - 16	
					QC 7 - 17	
					QC 7 - 18	
					QC 7 - 19	
					QC 7 - 2	
					QC 7 - 28	
					QC 7 - 3	
					QC 7 - 30	
					QC 7 - 34	
					QC 7 - 36	
					QC 7 - 37	
					QC 7 - 38	
					QC 7 - 41	
					QC 7 - 47	
					QC 7 - 48	
					QC 7 - 51	
					QC 7 - 58	
					QC 7 - 59	
116 Skidtubes - 2 - B4B	1 pcs	12/14/18	0.00	2.25	QC 7 - 6	DAS
					QC 7 - 60	60
					QC 7 - 9	9-89
					QC 7 - 68	
					Skidtubes - 1 - B4B	
					Skidtubes - 2 - B4B	74
					Skidtubes - 3 - B4B	
					Skidtubes - 4 - B4B	



				Skidtubes - 5 - B4B	
				Skidtubes - 6 - B4B	
				Skidtubes - 7 - B4B	
118 QC 5	1 pcs	12/14/18	0.00 0.00	QC 5 - 10	
				QC 5 - 12	
				QC 5 - 16	
				QC 5 - 17	
				QC 5 - 18	
				QC 5 - 19	
				QC 5 - 22	
				QC 5 - 24	
				QC 5 - 3	
				QC 5 - 38	2B 18-11-10
				QC 5 - 42	
				QC 5 - 43	
				QC 5 - 49	
				QC 5 - 51	
				QC 5 - 58	
				QC 5 - 68	
				QC 5 - 9	
120 Skidtubes - Bend - 2 - B4B	1 pcs	12/14/18	0.00 1.27	Skidtubes - Bend - B4B	MGG TF
130 Skidtubes - 3 - B4B	1 pcs	12/14/18	0.00 2.25	Skidtubes - 1 - B4B	
				Skidtubes - 2 - B4B	
				Skidtubes - 3 - B4B	MGG
				Skidtubes - 4 - B4B	
				Skidtubes - 5 - B4B	
				Skidtubes - 6 - B4B	
				Skidtubes - 7 - B4B	
140 QC 6	1 pcs	12/14/18	0.00 0.00	QC 6 - 16	
				QC 6 - 38	QCS-18 BE
				QC 6 - 42	
				QC 6 - 9	
				QC 6 - 68	
150 Skidtubes - 4 - B4B	1 pcs	12/14/18	0.00 0.00	Skidtubes - 1 - B4B	DO
				Skidtubes - 2 - B4B	
				Skidtubes - 3 - B4B	MGG
				Skidtubes - 4 - B4B	
				Skidtubes - 5 - B4B	BE
				Skidtubes - 6 - B4B	
				Skidtubes - 7 - B4B	
160 QC 10	1 pcs	12/14/18	0.00 0.00	QC 10 - 10	
				QC 10 - 16	
				QC 10 - 18	
				QC 10 - 24	DAS
				QC 10 - 38	38
				QC 10 - 43	9-89
				QC 10 - 50	
				QC 10 - 58	
				QC 10 - 9	
170 QC 6	1 pcs	12/14/18	0.00 0.00	QC 6 - 16	DAS
				QC 6 - 38	38
				QC 6 - 42	9-89
				QC 6 - 9	
				QC 6 - 68	
175 Handfinish - 2-1 Pressure-B4B	1 pcs	12/14/18	0.00 1.41	Handfinish - 2 - 1 - B4B	D.R 18/11/29
180 Powdercoat - 11 Gls Blk(A)-B4B	1 pcs	12/14/18	0.00 1.00	Powdercoat - 1 - B4B	
				Powdercoat - 2 - B4B	
				Powdercoat - 3 - B4B	PR 18/12/10
				Powdercoat - 4 - B4B	
190 QC 3	1	12/14/18	0.00 0.00	QC 3 - 10	

pcs				QC 3 - 13		
				QC 3 - 15	21 12-12-10	
				QC 3 - 16		
				QC 3 - 17		
				QC 3 - 18		
				QC 3 - 2		
				QC 3 - 26		
				QC 3 - 28		
				QC 3 - 3		
				QC 3 - 30		
				QC 3 - 34		
				QC 3 - 36		
				QC 3 - 38		
				QC 3 - 41		
				QC 3 - 51		
				QC 3 - 58		
				QC 3 - 59		
				QC 3 - 6		
				QC 3 - 68		
				QC 3 - 9		
200	Handfinish - 4-1-Assembly-B4B	1 pcs	12/14/18	0.00 0.00	Handfinish - 4 - 1 - B4B	21 12-12-11
					Handfinish - 4 - 10 - B4B	
					Handfinish - 4 - 11 - B4B	
					Handfinish - 4 - 12 - B4B	
					Handfinish - 4 - 13 - B4B	
					Handfinish - 4 - 14 - B4B	
					Handfinish - 4 - 15 - B4B	
					Handfinish - 4 - 2 - B4B	
					Handfinish - 4 - 3 - B4B	
					Handfinish - 4 - 4 - B4B	
					Handfinish - 4 - 5 - B4B	
					Handfinish - 4 - 6 - B4B	
					Handfinish - 4 - 7 - B4B	
					Handfinish - 4 - 8 - B4B	
					Handfinish - 4 - 9 - B4B	
210	QC 5	1 pcs	12/14/18	0.00 0.00	QC 5 - 10	
					QC 5 - 12	
					QC 5 - 16	
					QC 5 - 17	
					QC 5 - 18	
					QC 5 - 19	
					QC 5 - 22	
					QC 5 - 24	
					QC 5 - 3	
					QC 5 - 38	
					QC 5 - 42	
					QC 5 - 43	
					QC 5 - 49	
					QC 5 - 51	
					QC 5 - 58	



				QC 5 - 68	D 12-12-19
				QC 5 - 9	
213 DC - 1 - B4B	1	12/14/18	0.00 0.00	DC - 1 - B4B	DAS 69 9-89
pcs				DC - 2 - B4B	
215 Packaging 3-1 - Stock - B4B	1	12/14/18	0.00 0.00	Packaging 3 - 1 - B4B	DAS 21 DEC 19 2018
pcs				Packaging 3 - 2 - B4B	
				Packaging 3 - 3 - B4B	
				Packaging 3 - 4 - B4B	
				Packaging 3 - 5 - B4B	
220 QC 21 - FG	1	12/14/18	0.00 0.00	QC 21 - FG - 16	DAS 21 DEC 19 2018
pcs				QC 21 - FG - 21	

Part Op 110 - 1- Inspect mat'l D2500-1-190 for damage 2-Cut D2500-1-190 per Dwg D2590 .Deburr ends 3-Drill pilot holes using Descriptions: drill jig DT 8149 & DT8711-1&2 and open to finish size as per dwg 4-Deburr holes as per QSI002 section 4.2.3 and blow out all chips from inside of tube. Test fit DT9916 on fwd and aft saddles.

112 - 1-Acid etch and Alodine tube per QSI 005 4.1

113 - (QC7-Inspect Chemical Conversion Coat)

116 - 1-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting Pick: Qty Part Number Description Batch

A/R Sikaflex-291 M/38948 Sikaflex expire date: Apr 1 2019 Start Time: _____ Fin Time: _____

118 - QC5- Inspect part completeness to step on W/O

120 - (CNC Delta 100 Bender), Bend as per program D2590.C on CNC Bender

130 - 1-Cut tubes as per Dwg. D2590 . 2-Deburr ends after cutting.

140 - QC6- All purchased or subcontracted products

150 - 1-Prepare tube for welding D2576-3 Step Remove alodine as required. 2-Weld step D2576 as per Dwg. D2590 and QSI 004 A/R Aluminum Rod B8673 3-Grind weld flush on step 4-Insert D4202-1 spacer, swage as per QSI002 and trim/ grind flush per QSI002 and as per dwg 5-Drill holes for wearplates using DT 8218 & DT8937 Open holes to 19/64", adjust stopper not to hit web.Deburr 6-Drill pilot holes for aft cap using DT 8215 Open holes to #6 Drill bit. Deburr 7-Drill pilot holes for Tow ring using DT9425, open to .640"and Deburr ****verified dim. before drilling****

160 - QC10- Inspect visual per QSI004- ground welds

170 - QC6- All purchased or subcontracted products

175 - (Pressure Wash per QSI005 4.3/ Clean and remove all markings), Pressure Wash per QSI005 4.3 Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch.

180 - Black Gloss per QSI005 4.3-Alum START TIME: _____ OVEN TEMPERATURE: 320° FINISH TIME: M/38939

190 - QC3- Inspect Part Finish

200 - 1-Install inserts & wearplates & gaskets using a drop of Sikaflex on insert holes before installing wearplates A/R Sikaflex-291 _____ Sikaflex expire date: _____ 2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580 3-Inspect for foreign object per QSI 024 4-Install 2855 Aft Cap as per Dwg D2590 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive A/R Sikaflex-291 _____ Sikaflex expire date: _____

5-Wing Walk as per Dwg D2590 and QSI 005 4.4 Batch: _____

210 - QC5- Inspect part completeness to step on W/O

213 - Document Control Photocopy bluefile & type labels per PPP D204-635-041 CHG 005

215 - Identify as per dwg & Stock Location: _____

220 - QC21- Final Inspection - Work Order Release

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D2500-1-190	Ext'n -I' Beam Tube 4"	1 Ea (1 ea)	110-Skidtubes - 1	<u>512963</u>
D2597	204 Web	1 Ea (1 ea)	110-Skidtubes - 1	<u>506975</u>
D2576-3	Step (Machining Detail)	1 Ea (1 ea)	150-Skidtubes - 4 - B4B	<u>5089827</u>
D4202-1	Spacer	17 Ea (17 ea)	150-Skidtubes - 4 - B4B	<u>5121344</u>
ALS7-1032-130	Rivnut	44 Ea (44 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5112899</u>
AN3-5A	Bolt	2 Ea (2 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5095480</u>
AN3C4A	Bolt	44 Ea (44 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5095723</u>
D2594-1	Plug	10 Ea (10 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5126336</u>
D2594-3	O-Ring	10 Ea (10 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5106795</u>
D2855	Cap	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5126349</u>
D3564-11 -	Wearplate Aft	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5108075</u>
D3564-13 -	Wearpad Fwd	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5107996</u>
D3564-7 -	Wearplate Center	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5054595</u>
D3564-9 -	Wearplate Fwd	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5120439</u>
D3566-1	Gasket Aft / Fwd	2 Ea (2 ea)	200-Handfinish - 4-1-Assembly-B4B	
D3566-13	Gasket Fwd	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	
D3566-7	Gasket Center	1 Ea (1 ea)	200-Handfinish - 4-1-Assembly-B4B	
NAS1149C0332R	Washer	44 Ea (44 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5089465</u>
NAS1149D0332J	Washer	2 Ea (2 ea)	200-Handfinish - 4-1-Assembly-B4B	<u>5100407-1</u>

540
86
88-8

1941
1942
1943

Job Allocations				
Operation	Component Part	Required	Inventory	Allocated
110-Skidtubes - 1	D2500-1-190	1	8	0
	D2597	1	2	0
150-Skidtubes - 4 - B4B	D2576-3	1	37	0
	D4202-1	17	346	0
200-Handfinish - 4-1-Assembly-B4B	ALS7-1032-130	44	1,591	0
	AN3-5A	2	314	0
	AN3C4A	44	2,024	0
	D2594-1	10	160	0
	D2594-3	10	472	0
	D2855	1	92	0
	D3564-11	1	19	0
	D3564-13	1	15	0
	D3564-7	1	4	0
	D3564-9	1	25	0
	D3566-1	2	20	0
	D3566-13	1	17	0
	D3566-7	1	25	0
	NAS1149C0332R	44	3,229	0
	NAS1149D0332J	2	1,945	0
Part Specifications				
Specifications could not be found.				

Plex 11/12/18 1:54 PM Dart.Hadley.Shannon

LIST OF MATERIALS				
ITEM	QTY -041	QTY -043	PART NUMBER	DESCRIPTION
1	X		D2590-041	SKIDTUBE ASSEMBLY
2		X	D2590-043	SKIDTUBE ASSEMBLY
3	1	1	D2500-1-190	EXTRUSION
4		16	D2570	BUSHING
5	1	1	D2576-3	STEP
6	10	4	D2594-1	PLUG
7	10	4	D2594-3	O-RING
8	1	1	D2597	204 WEB
9	1	1	D2855	AFT CAP
10	1		D3564-7	WEARSHOE
11	1		D3564-9	WEARSHOE
12	1		D3564-11	WEARSHOE
13	1		D3564-13	WEARSHOE
14	2		D3566-1	GASKET
15	1		D3566-7	GASKET
16	1		D3566-13	GASKET
17	17	22	D4202-1	SPACER
18		1	D4408-041	WEARPLATE ASSEMBLY
19		1	D4408-043	WEARPLATE ASSEMBLY
20	44		ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
21	44		AN3C4A	BOLT
22	2	2	AN3-5A	BOLT
23		8	AN4-45A	BOLT
24	44		NAS1149C0332R	WASHER (AN960C10L)
25	2	2	NAS1149D0332J	WASHER (AN960JD10L)
26		8	MS21042-4	NUT (OR MS21042L4)



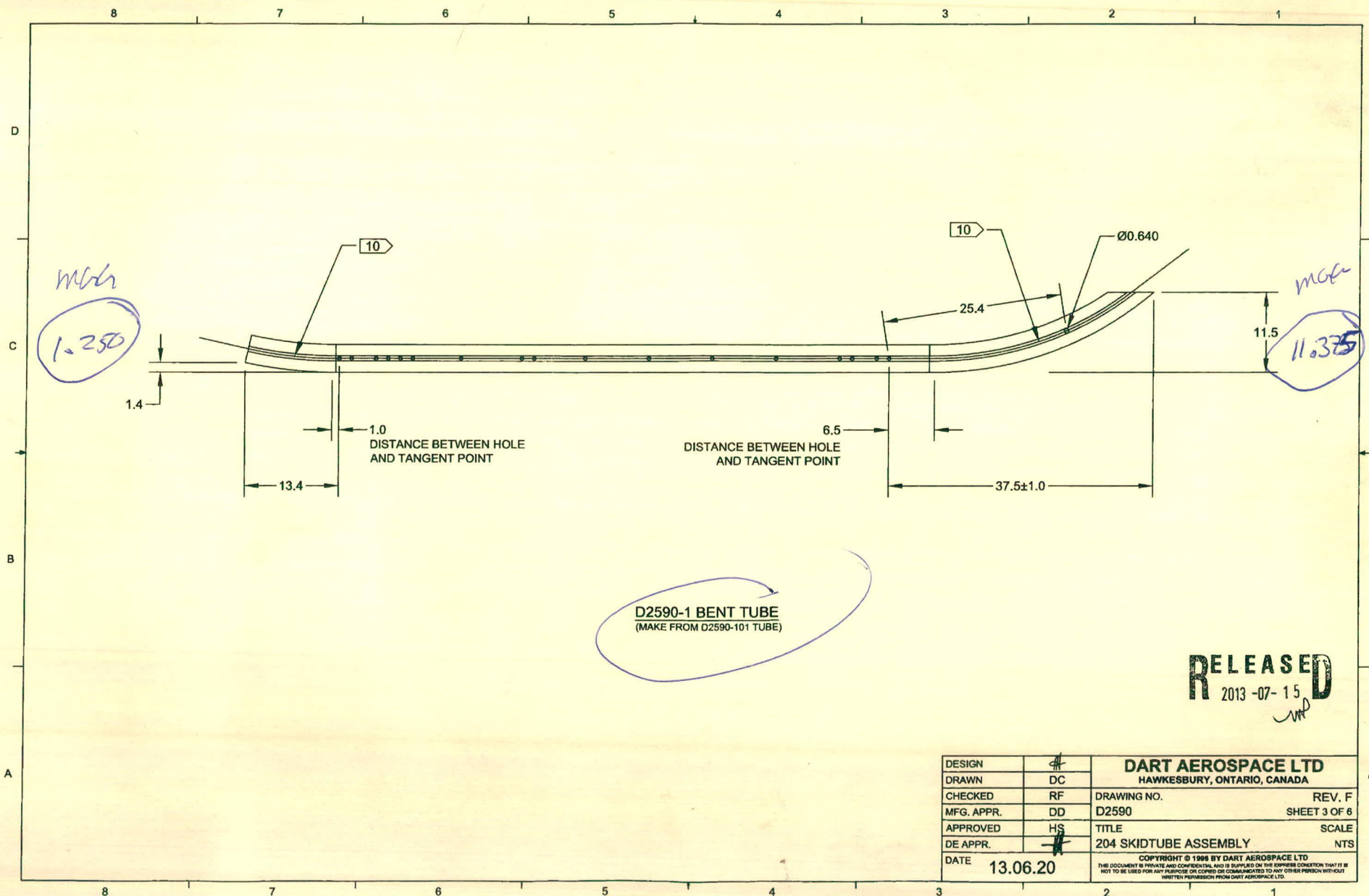
GENERAL NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: CHEMICAL CONVERSION PER DART QSI 005 4.1 PRIOR TO INSERTING D2597 WEB
POWDER COAT ASSEMBLY GLOSS WHITE 4.3.5.1 PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4.
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: D2590-041 = 31.5 lbs
D2590-043 = 33.3 lbs
- 8) WELDING PER DART QSI 004.
- 9) INSERT D2597 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 10) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 11) USE DART DRILL TEMPLATE DT8218 ONLY FOR D2590-041 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION B-B (44 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND NAS1149C0332R WASHERS WITH SIKAFLEX-241/-291.
- 12) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (10 PLACES FOR D2590-041 AND 8 PLACES FOR D2590-043).
- 13) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION.

RELEASED
2013-07-15

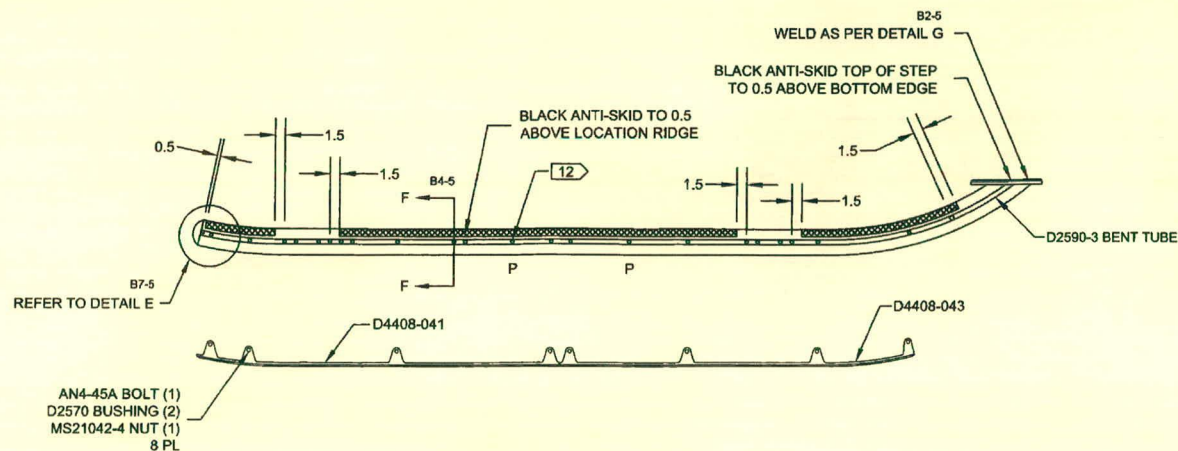
F	INCORPORATE DEO D2590-E-1 PER PAR12-218	DC	13.06.20
E	ADD D2590-043; DT8218 WAS TD2577-204 (ZN C4-1); REFORMATTED DRAWING TO CURRENT STANDARDS	RF	11.06.21
D	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124	PH	07.04.05
C	REDRAWN, INCLUDED DEO 9084/ 9097	CP	98.08.28
B	AS MANUFACTURED	DS	96.12.02
A	NEW ISSUE	DS	96.09.16
REV.	DESCRIPTION	BY	DATE
DESIGN		DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	DC		
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	DD	D2590	SHEET 1 OF 6
APPROVED	HS	TITLE	SCALE
DE APPR.		204 SKIDTUBE ASSEMBLY	NTS
DATE	13.06.20	COPYRIGHT © 1986 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

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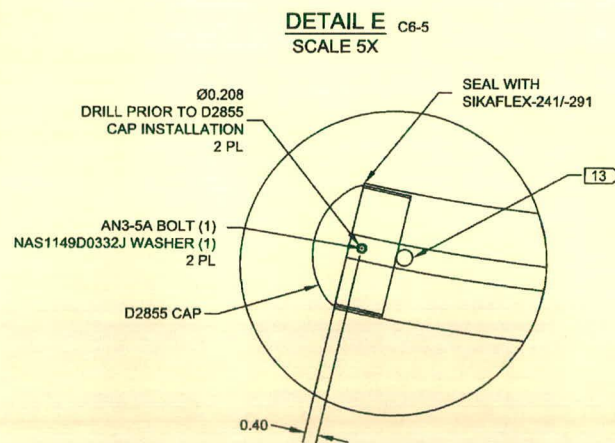


RELEASED
2013-07-15

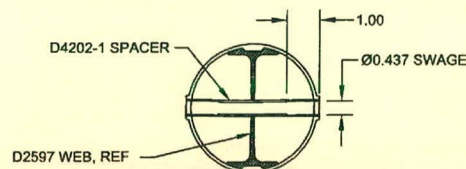
DESIGN	#	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	DC		
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	DD	D2590	SHEET 3 OF 6
APPROVED	HS	TITLE	SCALE
DE APPR.	#	204 SKIDTUBE ASSEMBLY	NTS
DATE	13.06.20	COPYRIGHT © 1996 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



D2590-043 ASSEMBLY DETAIL

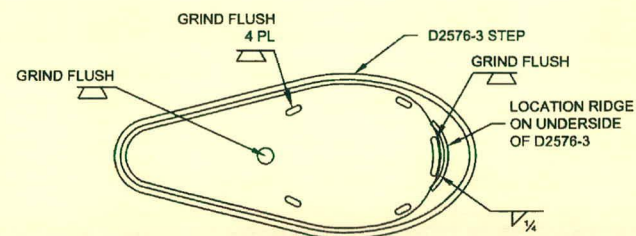


SECTION F-F D5-5
SCALE 5X



AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:
1. INSERT D4202-1 SPACER (22 PLACES)
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
3. TRIM/GRIND FLUSH PER QSI 002

DETAIL G D3-5
SCALE 5X



DESIGN	#	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	DC		
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	DD	D2590	SHEET 4 OF 6
APPROVED	HS	TITLE	SCALE
DE APPR.		204 SKIDTUBE ASSEMBLY	NTS
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RELEASED
2013-07-15

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS <table style="width:100%; border: none;"> <tr> <td style="width:15%;">Skid-tube ☒</td> <td style="width:15%;">Cross tube ☐</td> <td style="width:15%;">Water Jet ☐</td> <td style="width:15%;">Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>						Skid-tube ☒	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																													
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Date : 18/11/19		Step #:		QTY Effective :			MRB (QSI042) Approval INSP 12 9 18/11/19																																																														
Description Work Order Deviation				Disposition				Completed By 9/18/11/19																																																													
Aft bend is 1.250", Fwd bend is 11.325", both under bent.				Acceptable. No effect on strength or function.				Lead hand / Supervisor Approval Verification																																																													
								QC / QA Coordinator Approval																																																													
Root Cause <table style="width:100%; border: none;"> <tr><td>Environment ☐</td><td>No Re-verification ☐</td></tr> <tr><td>Design ☐</td><td>Operator ☐</td></tr> <tr><td>Doc/Data ☐</td><td>Offset/Setup ☐</td></tr> <tr><td>Equip/Tooling ☐</td><td>Supplier ☐</td></tr> <tr><td>Handling/Pre ☐</td><td>Training ☐</td></tr> <tr><td>Material ☐</td><td>Use for Testing ☐</td></tr> <tr><td>Internal Transport ☐</td><td>Poor Information ☐</td></tr> <tr><td>Tribal Knowledge ☐</td><td>Rushing ☐</td></tr> <tr><td>LOA ☐</td><td>Product Improvement ☐</td></tr> <tr><td>Substation ☐</td><td>Process Improvement ☐</td></tr> <tr><td>Past Expiry Date ☐</td><td>Manufacturing Process ☐</td></tr> <tr><td>Misidentified ☐</td><td>Past Due ☐</td></tr> </table>		Environment ☐	No Re-verification ☐	Design ☐	Operator ☐	Doc/Data ☐	Offset/Setup ☐	Equip/Tooling ☐	Supplier ☐	Handling/Pre ☐	Training ☐	Material ☐	Use for Testing ☐	Internal Transport ☐	Poor Information ☐	Tribal Knowledge ☐	Rushing ☐	LOA ☐	Product Improvement ☐	Substation ☐	Process Improvement ☐	Past Expiry Date ☐	Manufacturing Process ☐	Misidentified ☐	Past Due ☐	FAULT CATEGORY <table style="width:100%; border: none;"> <tr><td>Pressure/Forced ☐</td><td>Temperature/Cure ☐</td><td>Power Loss/Surge ☐</td><td>Positioned Wrong ☐</td></tr> <tr><td>Bending ☐</td><td>Set-up ☐</td><td>Folio/Program ☐</td><td>Outside Dimensions ☐</td></tr> <tr><td>Centre Not Concentric ☐</td><td>BOM/Route ☐</td><td>Grain ☐</td><td>Over/Under tolerance ☐</td></tr> <tr><td>Cracks ☐</td><td>Broken/Damage/Defect ☐</td><td>Weld ☐</td><td>Part Incorrect ☐</td></tr> <tr><td>Crimp/Kink/Ripple/Wave ☐</td><td>Inspection Incomplete/Unqualified ☐</td><td>Wrong Stock Pulled ☐</td><td>Part Lost/Missing ☐</td></tr> <tr><td>Cuffs ☐</td><td>Contamination ☐</td><td>Out of Sequence ☐</td><td>Part Moved ☐</td></tr> <tr><td>Crushing ☐</td><td>Countersink ☐</td><td>Off-set ☐</td><td>Drawing ☐</td></tr> <tr><td>Heat Treat ☐</td><td>Cut Too Short ☐</td><td>Mislabeled ☐</td><td>Finish ☐</td></tr> <tr><td>Wave/Twist in Tube ☐</td><td>Instructions Incomplete/Unclear ☐</td><td>Fit/Function ☐</td><td>Misread ☐</td></tr> <tr><td>Marks/Chatter ☐</td><td>Drill Holes ☐</td><td>Misaligned/off center ☐</td><td>Turning Sequence ☐</td></tr> </table>		Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐	OTHER : _____	
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Entered: _____ Date: _____

WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

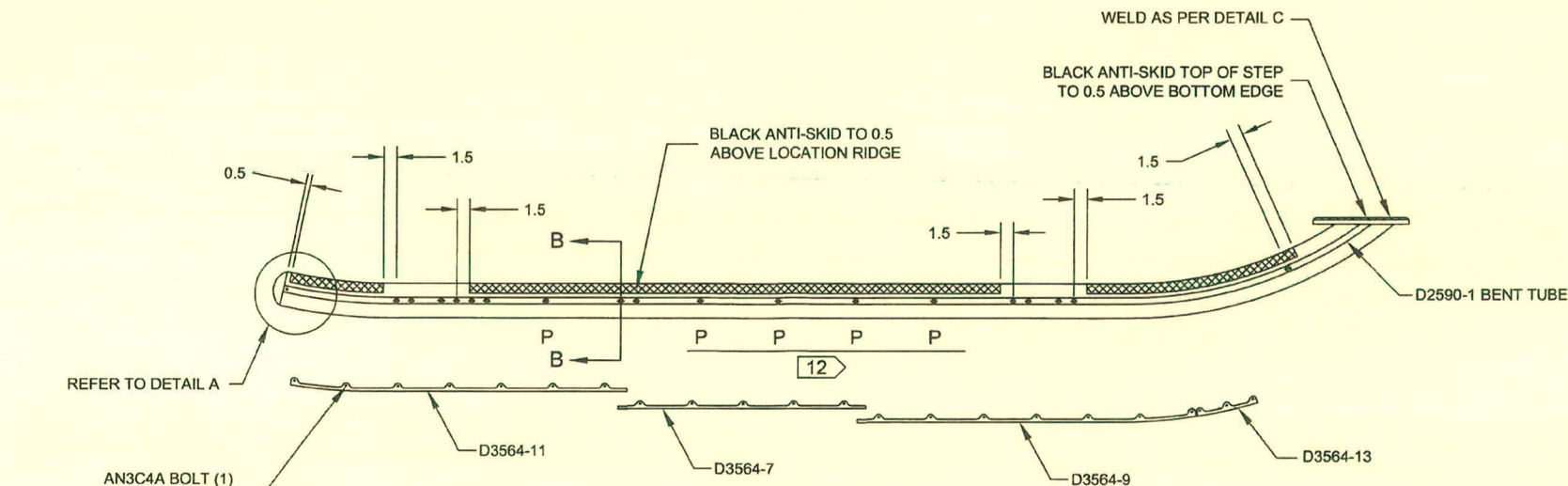


NCR No. _____

Route update only ☒

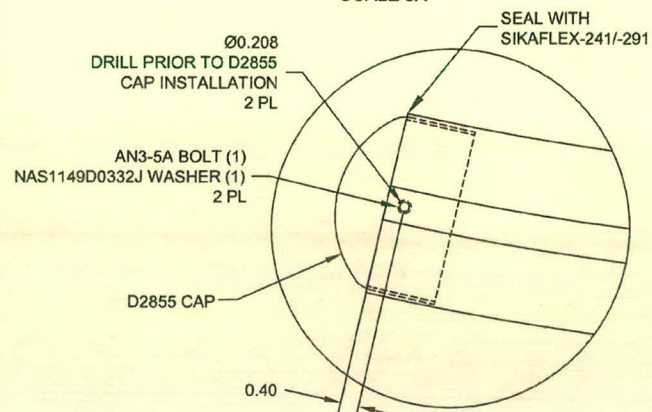
Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☒ Water Jet ☐ Supplier ☐ Quality ☐		
Date : <u>18/12/18</u>	Sequence #:	QTY Affected :		MRB (QSI042) <u>INSP</u> <u>12</u> <u>18/12/18</u>
Description Work Order Deviation		Disposition		Completed By
Skid tubes are assembled without gaskets.		Inspect to DZ690 Rev.G DZ04-635-041 now CHG 006 Ref BAWB-865		Lead hand / Supervisor
Root Cause		FAULT CATEGORY		
Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Presservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐	☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled	☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function	☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up	☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread
Other/Details:				

8 7 6 5 4 3 2 1

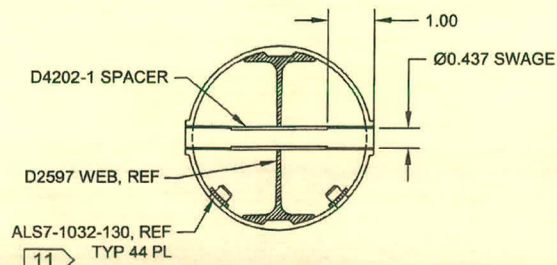


D2590-041 ASSEMBLY DETAIL

DETAIL A
SCALE 5X

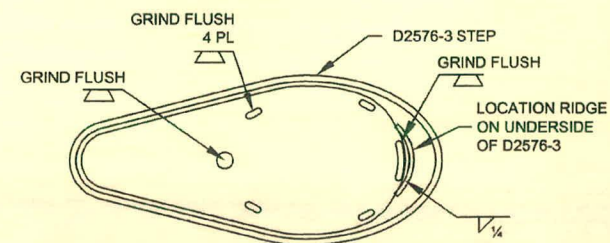


SECTION B-B
SCALE 5X



AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:
1. INSERT D4202-1 SPACER (17 PLACES)
2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
3. TRIM/GRIND FLUSH PER QSI 002

DETAIL C
SCALE 4X



DESIGN	4	DART AEROSPACE LTD	
DRAWN	SAD	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ZF	DRAWING NO.	REV. G
MFG. APPR.	DD	D2590	SHEET 2 OF 6
APPROVED	ND	TITLE	SCALE
DE APPR.	47	204 SKIDTUBE ASSEMBLY	NTS
DATE	18.12.14	COPYRIGHT © 1996 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

RELEASED

2018 DEC 13

8 7 6 5 4 3 2 1

ITEM	QTY -041	QTY -043	PART NUMBER	DESCRIPTION
	X		D2590-041	SKIDTUBE ASSEMBLY
1		X	D2590-043	SKIDTUBE ASSEMBLY
2	1	1	D2500-1-190	EXTRUSION
3		16	D2570	BUSHING
4	1	1	D2576-3	STEP
5	10	4	D2594-1	PLUG
6	10	4	D2594-3	O-RING
7	1	1	D2597	204 WEB
8	1	1	D2855	AFT CAP
9	1		D3564-7	WEARSHOE
10	1		D3564-9	WEARSHOE
11	1		D3564-11	WEARSHOE
12	1		D3564-13	WEARSHOE
13	17	22	D4202-1	SPACER
14		1	D4408-041	WEARPLATE ASSEMBLY
15		1	D4408-043	WEARPLATE ASSEMBLY
16	44		ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
17	44		AN3C4A	BOLT
18	2	2	AN3-5A	BOLT
19		8	AN4-45A	BOLT
20	44		NAS1149C0332R	WASHER (AN960C10L)
21	2	2	NAS1149D0332J	WASHER (AN960JD10L)
22		8	MS21042-4	NUT (OR MS21042L4)

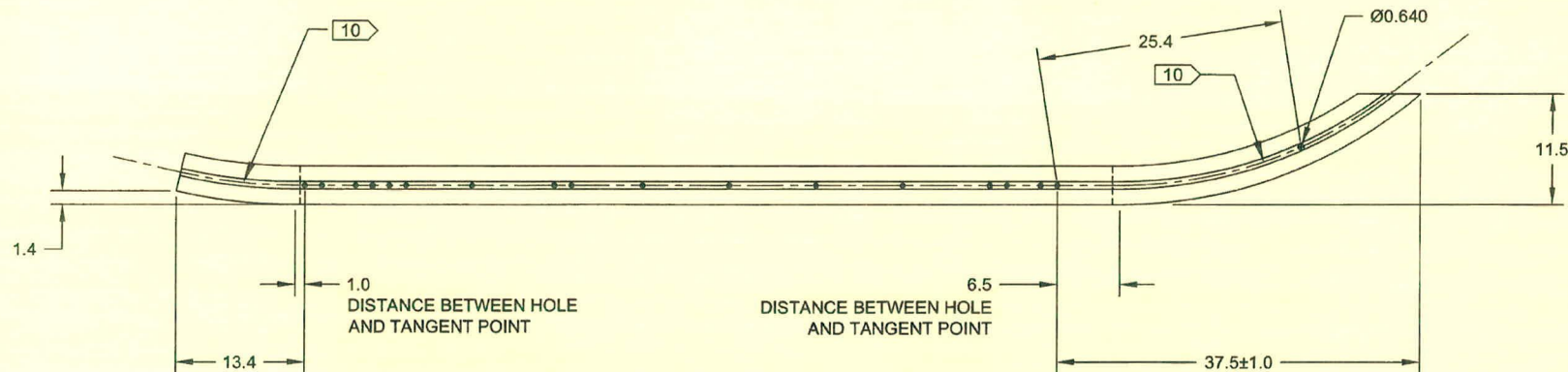
GENERAL NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: CHEMICAL CONVERSION PER DART QSI 005 4.1 PRIOR TO INSERTING D2597 WEB
POWDER COAT ASSEMBLY GLOSS WHITE 4.3.5.1 PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4.
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: D2590-041 = 30.6 lbs
D2590-043 = 33.3 lbs
- 8) WELDING PER DART QSI 004.
- 9) INSERT D2597 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 10) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 11) USE DART DRILL TEMPLATE DT8218 ONLY FOR D2590-041 TO LOCATE AND DRILL $\varnothing$ 0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION B-B (44 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND NAS1149C0332R WASHERS WITH SIKAFLEX-241/-291.
- 12) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (10 PLACES FOR D2590-041 AND 8 PLACES FOR D2590-043).
- 13) IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION.

G	SHEET 1 : PL DELETE D3566-1/-7/-13 GASKETS, WEIGHTS UPDATED ACCORDINGLY. SHEET 2 PICTORIAL UPDATE FOR REMOVAL OF GASKETS	SAD	18.12.14
F	INCORPORATE DEO D2590-E-1 PER PAR12-218	DC	13.06.20
E	ADD D2590-043; DT8218 WAS TD2577-204 (ZN C4-1); REFORMATTED DRAWING TO CURRENT STANDARDS	RF	11.06.21
D	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124	PH	07.04.05
C	REDRAWN, INCLUDED DEO 9094/ 9097	CP	98.08.28
B	AS MANUFACTURED	DS	96.12.02
A	NEW ISSUE	DS	96.09.16
REV.	DESCRIPTION	BY	DATE
DESIGN	4	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	SAD		
CHECKED	ZF		
MFG. APPR.	DD		
APPROVED	VO		
DE APPR.	41	DRAWING NO. REV. G	
		D2590 SHEET 1 OF 6	
		TITLE SCALE	
		204 SKIDTUBE ASSEMBLY NTS	
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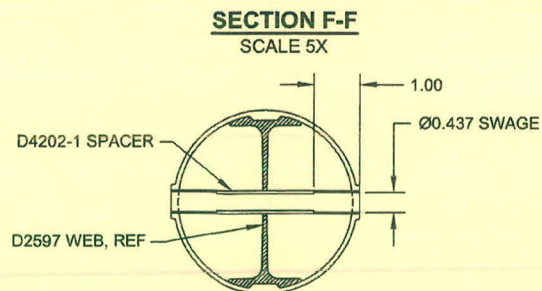
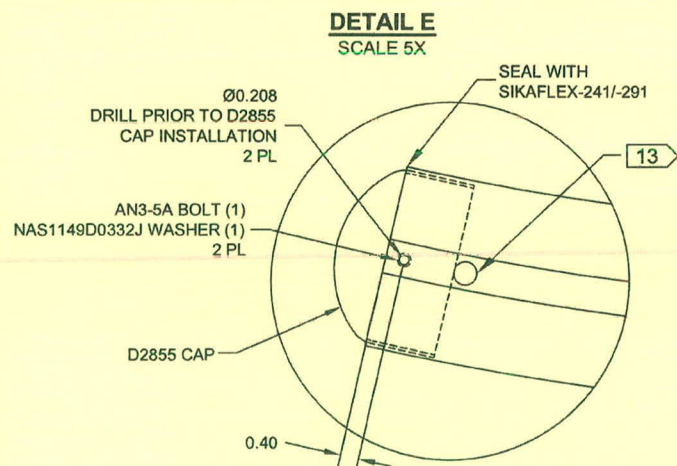
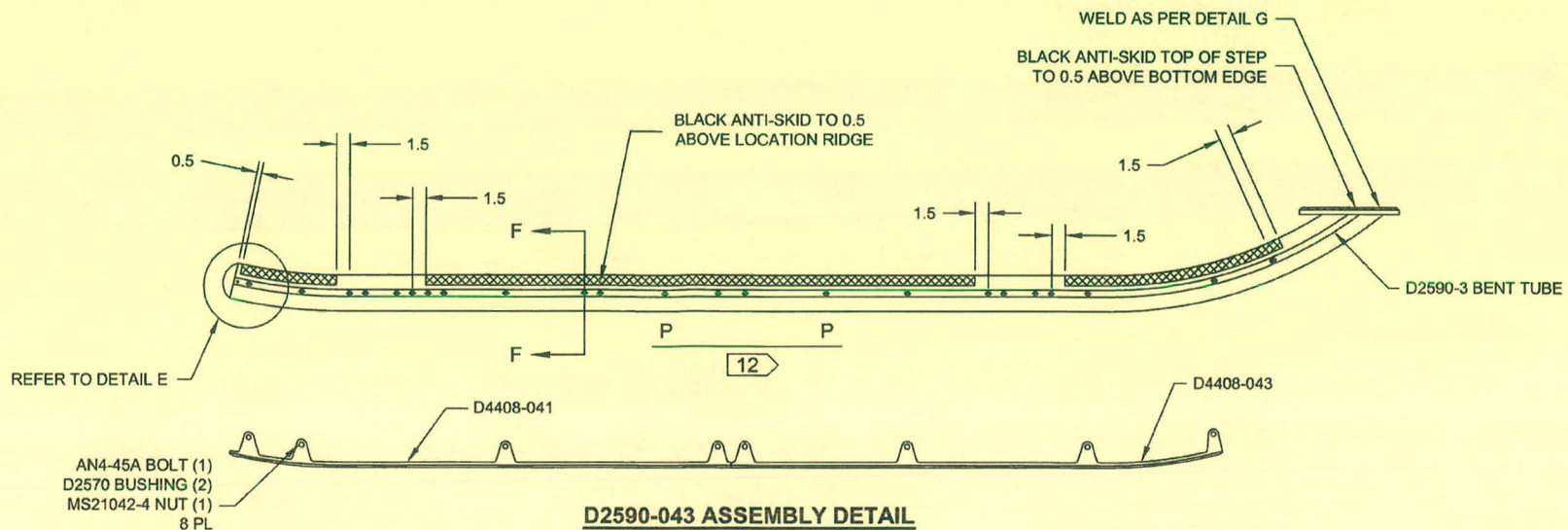
2018 DEC 18
EEN 18-865



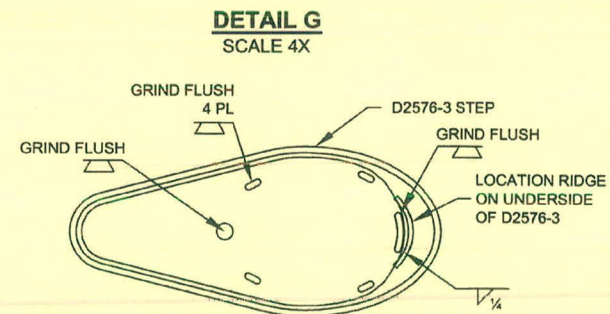
D2590-1 BENT TUBE
(MAKE FROM D2590-101 TUBE)

RELEASED
2018 DEC 13

DESIGN	4	DART AEROSPACE LTD	
DRAWN	SAD	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ZF	DRAWING NO.	REV. G
MFG. APPR.	DD	D2590	SHEET 3 OF 6
APPROVED	No	TITLE	SCALE
DE APPR.	4	204 SKIDTUBE ASSEMBLY	NTS
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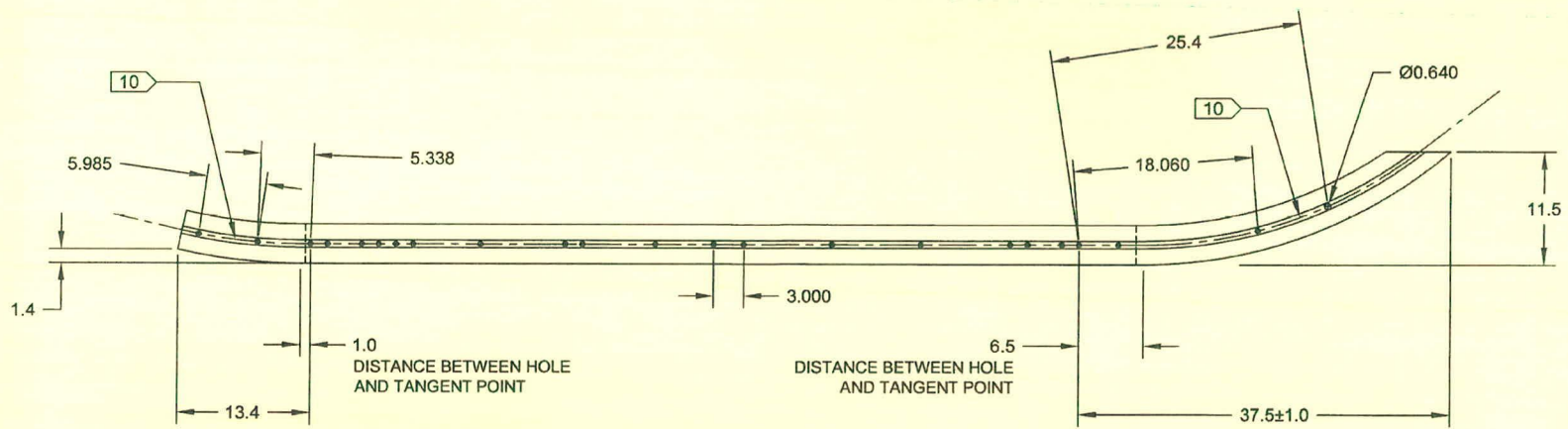
AFTER DRILLING AND BENDING ASSEMBLY PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:
 1. INSERT D4202-1 SPACER (22 PLACES)
 2. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
 3. TRIM/GRIND FLUSH PER QSI 002



RELEASED

10:8 DEC 13 1997

DESIGN	4	DART AEROSPACE LTD	
DRAWN	SAD	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ZF	DRAWING NO.	REV. G
MFG. APPR.	DD	D2590	SHEET 4 OF 6
APPROVED	NO	TITLE	SCALE
DE APPR.	Q	204 SKIDTUBE ASSEMBLY	NTS
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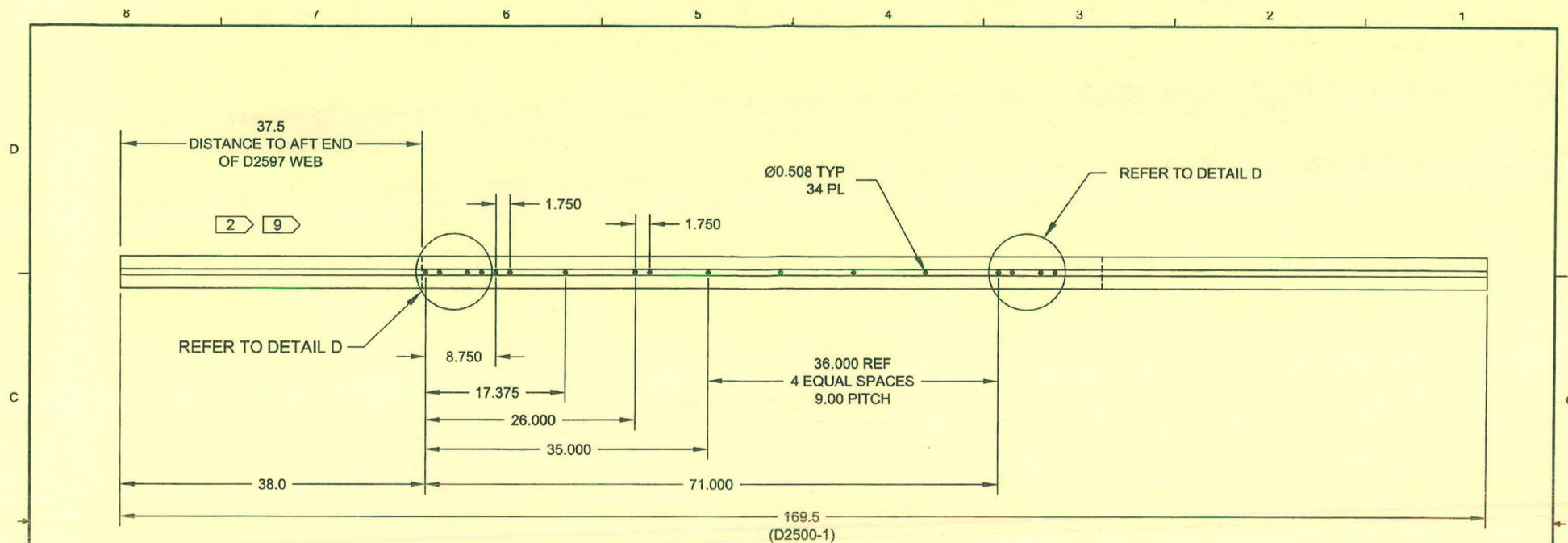


D2590-3 BENT TUBE
(MAKE FROM D2590-101 TUBE)

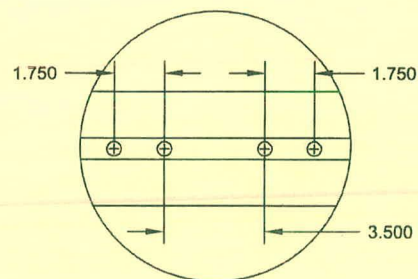
RELEASED

108 DEC 13 41

DESIGN	4	DART AEROSPACE LTD	
DRAWN	SAD	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ZF	DRAWING NO.	REV. G
MFG. APPR.	DD	D2590	SHEET 5 OF 6
APPROVED	ND	TITLE	SCALE
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D2590-101 TUBE



DETAIL D
SCALE 5X

DESIGN	4	DART AEROSPACE LTD	
DRAWN	SAD	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ZF	DRAWING NO.	REV. G
MFG. APPR.	DD	D2590	SHEET 6 OF 6
APPROVED	NO	TITLE	SCALE
DE APPR.	UP	204 SKIDTUBE ASSEMBLY	NTS
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10.8 DEC 13